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AUTHOR Saveland, R. N.; Pannell, C. W.
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ABSTRACT

This survey of recent research identifies major trends in American geographic education and evaluates some of the recent research. The document builds on two previous works on research in geographic education: "Research in Geographic Learning," Journal of Geography, 1972, and "Research Needs in Geographic Education, Suggestions and Possibilities," by the National Council on Geographic Education, 1967. The research is organized into seven topics. The first four topics cover interests and attitudes of both teachers and students, the historical development of ideas, comparative education, and assessment and examinations. The fifth topic, curriculum and curricular change, examines status studies, foundations studies, needs assessments, developmental studies, evaluation studies, and dissemination studies. The final two topics are cognitive development and techniques of teaching, including the inquiry process, the use of visuals, new approaches, new materials, and projects. The document concludes that the three main areas of progress are research in cognitive development and the ability of children to learn geography; curriculum, curricular changes, and materials; and research on teaching techniques. Several specific research needs were identified: foundations studies, the effect of values on the direction of geography, strategies for improving student motivation, further studies of mastery learning, and means of improving the dissemination process. (KC)

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OCCASIONAL PAPER No. 30

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SOME ASPECTS OF THE STUDY AND TEACHING OF GEOGRAPHY IN THE UNITED STATES

A REVIEW OF CURRENT RESEARCH, 1965 - 1975

R. N. SAVELAND and C. W. PANNELL

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EDITORIAL NOTE

This series of occasional papers is intended to be of value to the teacher in the classroom and the field both by suggesting practical ideas and by considering the rationale behind them. It is hoped that a balanced consideration of theory and practice will be found helpful in stimulating constructive teaching ideas for use with students and pupils at various levels of age and ability.

Few teachers would deny the importance of practice being informed by research, and of research questions growing out of practical classroom problems. For this reason, reviews of research are undertaken from time to time so as to assess trends in geography in education and to summarise conclusions.

This review of recent research in the United States has been prepared for the Geographical Association by Robert N. Saveland and Clifton W. Pannell of the University of Georgia as a companion paper to No. 18 in the series, which reviewed British research. In order to write the review, the authors undertook the compilation of an inventory of research over the ten year period 1965–75. The inventory is listed in the references, and is available as a separate publication from the University of Georgia Curriculum Project.

The review provides teachers with an analysis of trends in geographical education in the United States, a set of references for further investigation and a number of important implications for consideration in classroom practice. It also presents the particular viewpoints of the authors, proclaimed in a stimulating and challenging manner.

The editor would be pleased to receive suggestions from teachers about topics to be included in this series. Any ideas, whether they are applicable to the primary, secondary or further education field will be carefully considered.

Orders for these titles and standing orders for the series should be sent to the Geographical Association.

M. C. NAISH, M.A.

University of London
Institute of Education

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CONTENTS

	Page
Introduction	1
Interests and Attitudes	2
Promoting International Understanding Through Comparative Education ...	3
Historical—Development of Ideas	4
(i) Background to Development	4
(ii) Regional Geography and Level of Instruction for the Regional Approach	5
Assessment and Examinations	7
Curriculum and Curricular Change	8
Status studies	9
Foundations studies	9
Needs assessments	9
Developmental studies	10
Evaluation studies	10
Dissemination studies	10
Cognitive Development — Children's Thinking in Geography	10
Techniques of Teaching	13
(i) The Process of Inquiry	13
(ii) The Use of Visuals	13
(iii) New Approaches	14
(iv) Materials	15
(v) Projects	15
Conclusion	19
References	20

SOME ASPECTS OF THE STUDY AND TEACHING OF GEOGRAPHY IN THE UNITED STATES

A Review of Recent Research, 1965–1975

INTRODUCTION

Research in geographic education in the United States during the decade 1965–1975 did not take place in academic or intellectual isolation. It must be looked at in the context of the times. This was a decade marked by such historic events as the war in Vietnam, campus violence at Kent State, Watergate and its aftermath, and a serious economic recession which closed the period. Federal grants to education had been established earlier and throughout the 1960's a sizeable portion of the academic community was concerned with the game of grantsmanship, otherwise known as "Washington Roulette."

In educational circles the schools were giving much attention to "the inquiry method." This progressed into a concern about values and value systems which is still with us. The environmental movement tied into this concern, and this movement had a brief flowering at the time of the first Earth Day, April 22, 1970. Subsequently environmental issues appeared to recede in the face of the greater concern for economic conditions. Actually, the First Club of Rome Report, *Limits to Growth* (Meadows, 1972), has been followed by a second, *Mankind at the Turning Point* (Mesarovic, 1974), and concern for environmental problems remains with us as a significant and contentious issue of contemporary society.

Research in geographic education reflects in part the societal context of the times. At the same time the field reflects a logical progression of its own in which the present and future build on the recent and more remote past. In brief, academic disciplines and their derivative research efforts progressively witness new movements, directions and sometimes fads. There is, however, a certain basic framework or mainstream in the evolution of an academic discipline and its direction and growth build on the fundamentals of the enterprise. Geographic education is similar to other studies. During recent years, it has witnessed some fads, while it has also seen its mainstream develop along more conventional lines. Research in geographic education reflects both voguish and traditional currents, and probably will continue to do so. However, with declining school and college enrolments, there may be fewer doctoral students to investigate a broad array of worthwhile and innovative topics. Such a trend will reduce the amount of timely and valuable research on geographic education in future years. A period of consolidation of recent accomplishments in geographic education may be at hand.

Preparation of this report was suggested by M. C. Naish of the University of London Institute of Education as a companion piece to Naish's Teaching Geography Paper No. 18, *Some Aspects of the Study and Teaching of Geography in Britain: A Review of Recent British Research*. This present report was preceded by the compilation of an extensive bibliography on research in geographic education *(Inventory of Recent U.S. Research in Geographic Education*, 1975, hereafter referred to as *Inventory*). The *Inventory* provided an overview of work in the field of geographic education mainly since 1965, and was based on an Education Research Information Center (ERIC) computer search; a search of *Dissertation Abstracts: The Education Index* and the indices of numerous periodicals. These efforts notwithstanding, the *Inventory* was not exhaustive, but it did provide a good point of introduction for this survey.

Organization of the *Inventory* focused on several topics: 1) History and Background, 2) Curriculum 3) Method, 4) Materials, 5) Evaluation, and 6) Teacher Training. However, in organizing the survey this outline did not appear appropriate as a companion to the earlier compendium on research in geographic education in Britain (Naish, 1972). Consequently, the example of Naish's work was followed as a logical model, and the topical headings within the survey below parallel those selected by him to the extent practicable and logical. In following this, a few main trends and directions emerge as suggested above. These will be examined individually within the main topical headings and a general summary and appraisal will be developed as a conclusion.

INTERESTS AND ATTITUDES

Research into interests and attitudes can be expected to reflect the attention given to the affective domain in writing and research during the decade 1965–1975. Several studies incorporate references to motivation and to relevance in connection with comparisons of alternative methodologies. Reports on problem-solving procedures, for instance, usually mention the greater involvement of students which results in higher interest and improved attitudes towards course work. Other reports on field study and on games and simulations indicate the increased interest factor in these activities. Studies of readability and concept load point out the significance of these factors in maintaining a student's disposition towards class work. A few studies focus directly on attitudes.

Writing from experiences as an early director of the High School Geography Project, Pattison (1971) expressed the opinion that there appeared to be a shift among teachers and students from a view of geography as subject matter to be acquired, to a conception of geography as a field of inquiry and manner of knowing. He attributed this, in part, to direct classroom use of geographic literature. He further pointed out that geographers' attempts to define the field were often restrictive and that greater acceptance may be achieved by adopting a more pluralistic stance.

As a result of a research study of social studies teachers' perceptions of topics in geography, Bloomer (1971) found that social studies teachers do not value the same topics in geography as leaders in the field. His survey of 200 teachers in 26 states showed that the topics considered most important for a high school geography course included: environmental pollution, city location and growth, problems of world hunger, urbanization, urban analysis, cultural differences, socio-economic characteristics of urban areas, economic functions of cities, man-land relationships, agricultural production and exchange, technology, resource use and depletion, and scale-distance and direction.

A similar study by Peters (1969) looked for perceptual agreement among professional geographers, social studies teachers, and geography teachers on a word association test and a similarity-judgement test of seven key geographic concepts. These concepts were identified from geographic literature by the researcher. He found no significant difference between professional geographers and geography teachers on the similarity-judgement test. Between geography teachers and social studies teachers he found no significant differences on word association, but there was a significant difference on the similarity judgement test. Between the professional geographers and the social studies teachers there were significant differences on both tests. Both the Bloomer and the Peters studies point to differences between professional geographers and social studies teachers.

McCartin (1970) noted that affective or motivational variables screen all sensations and perceptions which occur in the school environment and to some extent determine what is learned in the cognitive (or knowledge) domain. She further affirmed that younger children have more closely fused cognitive and affective systems and went on to discuss curiosity, competition, and expectations of success or failure. She stated that a moderate amount of tension improves the chances of attaining a goal (p.250).

Both Sims (1968) and Pemberton (1970) made studies of attitudes and responses of college undergraduates. Sims compared the attitudes of students taught by closed-circuit television (CCTV) with those in the customary classroom-discussion situation. His findings showed no significant difference in attitudes between the two groups. He measured evaluative, activity, and potency attitudes for each of fifteen concepts. He concluded that the CCTV method was effective for developing favourable attitudes of students in introductory college geography.

Pemberton used 90 students in three laboratories on an introductory geography course at the University of Kansas to test developments in learning theory as applied to the field of geography. She confirmed assumptions that a problem-solving format would facilitate student's "becoming a treasure of resources for one another during the semester," and that the spatial arrangement of a class can be profitably analyzed as a problem of micro-geography.

Writing on the evaluation of affective learning, (that concerned with attitudes, feelings, beliefs), Ronald Carswell (1970) indicated that the study of attitudes, values, and beliefs does not seem to have such rigour and clarity as the study of central place theory or sequent occupance. He went on to describe practical ways of measuring changes of attitude in the classroom, giving specific examples of different techniques. He particularly focused upon approach and avoidance behaviour as an indicator of attitude. These measures are important for improving instruction so that more students can leave with positive feelings towards geography.

Although not a research article as such, Sister Mary Julian (1967) has made one of the few attempts to indicate specific strategies for helping students to "like" geography. Perhaps these suggested methods and others should be subjects for empirical analysis.

PROMOTING INTERNATIONAL UNDERSTANDING THROUGH COMPARATIVE EDUCATION

Considering the traditions of geography one would think that there might be many research studies into ways and means of developing empathy in students towards people in other cultures. On this point Graves quotes Carnie as follows:

> ". . . geographers have always felt a certain responsibility for the attitudes of children to foreign peoples, though the extent to which they can in fact influence children in such attitudes is apparently limited" (Graves 1975, p. 100).

The studies on international education in the *Inventory* are surprisingly few, containing but two entries, and the Carter (1974) study of international political geography concepts supports the contention that geographic concepts have largely been ignored in international studies.

One of the more serious issues of secondary and college geography in the United States in recent years has been a general neglect of geography as a curriculum tool to promote international understanding. Many college departments offer courses in foreign areas, and world regional geography continues to be a popular offering in many secondary schools and universities. But the number of offerings of such courses when compared with world civilization courses as taught in history departments is modest.

For example, if a student is interested in Africa or the Soviet Union, he is likely first to take one or more history courses focused on the foreign area. Later he may enrol in a political science or anthropology course, and a small group of students may take a regional geography course. Logic would suggest that the geography course should be taken first as a prerequisite to basic understanding of a foreign area, its physical environments, people and broad patterns of regional organization. Geographers are well qualified to provide such training, and many have lauded the synthesizing role of geography, yet rarely does one encounter this kind of logical approach or argument advanced to justify the role of regional geography in a broad college curriculum. Such an approach, however, could be practiced in specific area studies programmes where regional geography might find itself listed among required or optional courses.

Such a situation is not a consequence of lack of materials or teaching approaches. Indeed, a cursory survey of the last decade of the *Journal of Geography* would suggest much activity by scholars interested in developing teaching strategies oriented toward specific areas of the world. Moreover, a great deal of geographic research in the United States is focused on foreign areas. Geographers in the United States for many years have described and explained foreign areas to other geographers. Unfortunately little of this information has made much impact outside geography, nor have geographers in recent decades exerted the same influence in foreign policy debates as that of historians and political scientists.

Important exceptions exist. During World War II American intelligence agencies recognized the value of geographic area specialists, and such agencies continue to employ large numbers of geographers; their research is applied and often secret in nature. Otherwise geographers are not well established or well represented among foreign area specialists. Indeed some scholars hardly acknowledge the contribution of geographers to area studies (Lambert, 1975), a situation that only good and aggressive scholarship will correct. Rarely do geographers play a leading role in area studies organizations, in part perhaps because of their comparatively small number when contrasted with historians and political scientists, for example (Bonine, 1976).

That such a situation will continue is unlikely. As will be discussed later in a section on regional geography, geographic research on foreign areas is improving. As it improves and provides new knowledge about foreign areas, this will be translated into curriculum materials for instructional purposes at the college and secondary levels. Commercial publishers are engaged in some of this already. As new information from exotic and technical sources such as the LANDSAT multi-spectral remote sensing satellites is analysed by geographers, a need will exist to analyse and pass on this new data. Geography is at an advantage here, for its technical subfields permit it to process new information rapidly, especially on the physical environments and land use patterns of foreign areas (Welch, Pannell, and Lo 1975). Such efforts, moreover, should strengthen the position of geography within area studies as a legitimate and significant contributor to knowledge of foreign places. Geographers at all levels should be encouraged to contribute their special talents and knowledge to policy debate both in an abstract and applied manner. Such involvement will promote broader and more rapid acceptance of the work geographers accomplish.

The point to all of this is to suggest that geography can and should contribute to international understanding through its use as a tool for studying foreign areas. Perhaps too little has been done in the past. Now the recent growth and improved technical forms of analysis in geographic studies of foreign areas should be mirrored in what geography has to proffer at the secondary and college level. The basic research is underway, and new data sources promise a rapid increase in our knowledge and understanding of these foreign areas. What remains is to simplify, model, and transfer that knowledge into usable curricular materials and teaching programmes at several levels, and to expose much larger numbers of students to the worthwhile and significant geographic knowledge that exists now and will continue to be developed on foreign places.

HISTORICAL–DEVELOPMENT OF IDEAS

(i) Background to Development

General statements and overviews on the state of geography and geographic education in the United States exist in abundance. Most such statements are broad, and with a few exceptions these studies rarely follow a conscientious methodology and fail to explore the field of American geographic education systematically and comprehensively. Most of these attempt to identify problem areas in geography or suggest new or different approaches to geographic education or attempt to justify the need for geographic study in the school curriculum. Thus, a number of such studies relate to the status or position of geography in school curricula.

In some studies the role of geography in education is traced over a period of time, and these studies seek to identify trends in geography within academic programmes and to establish the evolution of the field of geography as a school subject over time (see *Inventory*, 1975, pp. 1–4). Some of these latter studies are valuable, especially those that examine specific cases and develop conclusions based on concrete

examples drawn from individual school systems. The conceptualization of such studies appears straightforward and simple. However, such studies did marshall a set of facts which are organized chronologically and resulted in an empirically-sound basis on which to evaluate geographic education. Conclusions may be drawn that reveal a great deal about the way in which geography has developed as a school and college discipline and how geographic study fits into overall academic programmes. More studies, based on rigorous examination of individual cases, will assist in the formulation of more insightful and profound postulates about the role of geography in education. Better knowledge of the past development of the field is certainly a seriously needed precondition on which to establish new studies and develop additional insights into the condition of American geographic education.

Another promising area of general study focuses on the role of values in geographic education and studies. Cirrincionne (1970) studied curriculum guides and journal articles in an examination of the role of values in teaching geography. He found the literature particularly devoid of any theories associated with values and valuation. Using a theory of values based on the writings of Dewey he developed a rationale and a method for treatment of value questions in geography.

The question of the role which values play in shaping and reflecting a culture and the meaning of values to geography and geographic study have been explored by Buttimer (1974). While her essay raises more questions than it answers, she has helped clarify what values mean to an academic enterprise characterized by a social scientific bent and has caused us to reflect profoundly on just how significant are such values and value systems. One question that she leaves unanswered is the role of geography in the future and how values will influence the directions in which geography moves as it searches to fulfil a professional position in society.

The amount of research conducted on values in geographic education is modest and recent, but it clearly is related to similar studies of value and their relationship to geography in general, a topic of considerable interest in recent years. Interest in values in geography has come in part from existentialist philosophy and indicates a strong linkage with humanistic studies in geography and a concern for real life events and situations (Buttimer, 1974 and Relph, 1970). Consequently, a new concern is emerging for the understanding of what lies behind the value system of American geography and how values operate to shape particular teaching strategies and materials. Such a concern is no doubt healthy for what it teaches us about ourselves and the nature of our academic enterprise (Tuan, 1971), To the extent that recent foci of research interest in geographic education are indicators of the condition and state of the field, the recent research in values in geography and geographic education is a welcome sign of continued vigour and freshness. If such trends continue the output of research on geographic education could benefit by the new direction and introspection.

(ii) Regional Geography and Level of Instruction for the Regional Approach

Specific attention in geographic education has focused on several themes and has been directed at all educational levels. For example, regional geography and the regional concept received considerable attention in recent years (see the essays of Kostbade 1968, Kohn 1970, and Augelli 1968, for example), and there is a persistent interest in the use of a regional approach at all levels of education. Thus, one finds regional geography taught at advanced and beginning levels in many colleges and universities. At the school level, geography is commonly taught as an introduction to the world as a vehicle to familiarize students with distributions of people, landforms, climate patterns, political systems, and cultures. As such, it has been argued that regional geography must per force be heavily descriptive (Kostbade 1968).

A review of essays concerned with the regional method and approach suggested that the conception of the regional method and approach is more commonly a traditional one, although a division between old and new regional geography has been recognized (Kohn 1970, Pattison 1964). In the traditional more commonly used approach, regionalism may be viewed on the one hand as an exercise in rote memorization where the technique is to describe the variety of earth space with emphasis on the variety. In such an approach, emphasis is placed on the areal distinctiveness of individual places and

countries, with learning rewards contingent on the ability to remember the most facts about the most places. While this no doubt has a place in education, it seems more appropriate at introductory levels, for it does not appear to place much premium on understanding the systematic organization of area and the processes underlying that organization, although as Gilbert White has suggested, such memorization will be much facilitated where integration with concepts and models is afforded (White, 1965).

On the other hand, to the extent that concepts were introduced many years ago in regional geographic instruction in schools and colleges, such concepts came to be associated commonly with man-land relations and in an interpretation that asserted a causal relationship between physical environment and human development and behaviour (Anderson 1967). As is well known this created serious controversy within the profession and may help to account for a period of neglect of geographic studies in schools and colleges. Lack of a well established subject matter during this developmental phase of the discipline coincided temporally with the environmental determinism controversy and resulted in a diminished appreciation for geography at the school level (Anderson 1967).

Most critically, the condition of regional geography suggests that the time lag between conceptual advance in the field of geography and the dissemination of such advances to school students is very considerable. During the decades of the 1950's and 1960's conceptual advances, partly associated with the use of statistics and quantitative methods, swept through geography. Regional geography also shared in that conceptual revolution, although many practitioners of regional geography have resisted new approaches to the teaching of regions. Such resistance could result because teachers may not understand these new techniques, methods and approaches or may be unaware of them. Examples of new approaches and techniques include, among others, computer cartography and mapping, remote sensing and various forms of quantitative analysis. Part of the image of regional geography that is negative suggests that its practitioners do not possess sufficient systematic technical skills, or prefer not to use the newer approaches.

Despite this negative image, an analytical approach in regional geography exists. It is an approach that places a premium on understanding why a region is organized spatially in a certain manner and how it operates as a spatial system. This analytical approach emphasizes dynamic, changing qualities and stresses models and general principles. It relies more heavily on new techniques and forms of quantitative analysis. The goal of this approach is better knowledge and understanding of an area, its physical and cultural patterns and functions, with the aim of viewing the assemblage as a region resulting from the interaction and interrelationship of multiple phenomena and events.

This last description is critical, for it indicates that the region is not recognized as objective reality existing prior to processes and activities that serve to identify and define it. For the teacher this means the emphasis must be placed on explaining the operational rationale of a region, which requires considerably more sophisticated knowledge of its history and cultural background than a knowledge of where the mountains and rivers are and which cities produce which goods. Equally important conceptually, it suggests that regional geography is not out-moded and old-fashioned and thus incompatible with modern geography. On the contrary good regional geography seeks to use the latest concepts and methods to achieve a more profound understanding of the processes that shape the specific region or areas under study. In part, the High School Geography Project and its curriculum materials reflected this. However, these new methods and materials have diffused in a sporadic way, and their value has not been ubiquitous.

Another quality of the regional approach is its value as a taxonomic or classifying instrument (Kostbade 1968). Regionalizing to geography has been compared to taxonomic classification of plants in botany, and may be viewed as an extension of the objective of ordering knowledge in the science of geography. Perhaps the analogy can be overdone, for there has been little systematic effort in geography to define regions with the rigour of the biological scientist; yet regionalizing as a form of spatial classification is increasingly important (Amedeo and Golledge, 1975), and the region remains one of the better means of ordering and classifying a great deal of information about human beings and their behaviour. As Duncan *et al* (1961) noted, while the region itself as an objective construct tells us little or nothing, its utility as a classifying device makes it extremely valuable in providing a base on which to understand and explain

many other more complicated behavioural patterns and activities, both human and natural. In this way it goes hand in glove with other traditions in geography as defined by Pattison: the spatial, man-land, and earth sciences approaches to geographical studies (Pattison 1964).

The point here is that some years ago regional and systematic geography were separated from one another at least in people's conceptions of the field. This dichotomy was in part depicted by Hartshorne 1939). Ever since, regional geography has suffered from an emphasis on the distinctiveness of place in which students are encouraged to learn all facts about all places, an approach guaranteed to bore and distress both the most assiduous and least inquisitive. Clinging to this approach is likely to condemn regional geography to second-class status as noted by Augelli (1968). The regional geographer must work harder, know more and be better equipped if he is to prosper in the current atmosphere of modern geography.

Regional practitioners in the area studies tradition, as noted earlier, must ensure that the recent ideas, techniques, and concepts in geography are transmitted to school levels. Early introduction of such knowledge and methods to students, for example at the 7th grade (early secondary) level, should serve the twin purposes of increasing understanding and interest in foreign areas. A critical need in geographic education would appear to be the development of curriculum materials by American academic geographers based on research findings in regional analysis. These materials must satisfy the twin purposes identified above: 1) to present useful and interesting information on foreign areas in a stimulating manner to school children and, 2) to use this information simultaneously to develop principles and concepts about the organization and operation of these areas and their interrelations.

ASSESSMENT AND EXAMINATIONS

Student performances on achievement tests have been a matter of public concern in the United States in the mid-1970's. Median scores have been going down in comparison with those of students in former years. Some have tended to place the blame on racial integration, busing, or the school consolidation movement. Others have questioned the validity of the tests. The usual response among school administrators is to put more emphasis on the teaching of fundamental skills.

Beyer and Hicks (1969) conducted an extensive survey of 7th and 12th grade (upper sixth equivalent) students in 24 states to find out their images of Africa. Some students matched stimulus words and regions of the world. A multiple-choice test on Africa alone was also devised and administered. The findings supported the hypothesis that students have stereotyped ideas and inaccurate information about Africa.

The "geographic illiteracy" of the American people as well as the school population has often been decried, as by Charlier and Charlier (1970). This has been further documented by the researches of Zdankowski (1970), Zacur (1970), Mason and Owen (1971), Hromyk (1972), and Ehemann (1974). Earlier place identification studies have evolved into perception studies related to the visibility of places in an effort to determine factors in association and retention.

In an isolated, but unusual, instance, the school system in Clearwater, Florida, administered the same test to prospective teachers seeking employment as it gave to eighth-grade students. Results indicated that the eighth-graders performed better than the prospective teachers! Copies of the tests and the scores were sent to the State Department of Education and the College of Education from which most of the prospective teachers were graduating.

There are eight entries under *Achievement Tests*, in the *Inventory*, and one of these is a British report. Scarfe (1965) described experiences in the preparation and administration of a Geography Achievement Test by the National Council for Geographic Education. Rice (1965) wrote of means for improving tests in geography at the elementary level. Monk (1971) and Glowatski (1973) focused on the role of objectives in test construction. Comprehensive achievement monitoring was the subject of a symposium of the California Educational Research Association (1974). Ryan (1974) discussed the effects on achievement of multiple student responses to different levels of questioning. *Evaluation in Geographic Education* was the subject of the 1971 Yearbook of the National Council for Geographic Education. In Chapter 9, Susan Wood reviewed commercially available achievement tests.

The studies in the *Inventory* indicate a two-fold nature of evaluation. One is to evaluate courses and programmes. The other is to evaluate individual student's awareness, retention, map conceptualization, and spatial abilities. To complete the process, these evaluation processes should lead to a determination of standards and norms.

CURRICULUM AND CURRICULAR CHANGE

Research relevant to geography's role in the school curriculum of the United States is hampered by the magnitude of the country and the diversity of practices under a system of local autonomy. Nevertheless, there is a surprising amount of similarity in curriculum from one place to another, possibly due in part to the efforts of national associations of professional educators and publishers of textbooks and educational materials. A highly developed communications system and a receptiveness to change on the part of some teachers and administrators contribute to the diffusion of educational innovations. In fact, the American educational system is characterized by fads of interest which sweep across it at rather regular intervals. Fads notwithstanding, there are also strong conservative factors operating on the school curriculum, especially in rural areas, and relatively large segments of the school population may be virtually untouched by the waves of curriculum reform movements.

Curriculum research may fall into various general categories. The following sets are suggested:

Status studies – reporting the place of geography in the school curriculum.

Foundations – identification and clarification of aims and objectives, concepts and principles.

Needs assessments – demonstrating areas of neglect and possibly indicating means for intervention (overlaps with methodological studies).

Developmental studies – determining maturation levels for skills and abilities for curriculum sequencing.

Evaluation studies – judging the effectiveness of a curriculum on a formative or summative basis.

Dissemination studies – noting the effectiveness of various change agents, such as new materials or a training programme for implementing a new curriculum.

It may be noted that certain research studies encompass more than one of the above sets.

Status studies – have already been discussed in the preceding section on historical development of ideas.

Foundations studies – are comparatively rare in research in geographic education. As Graves (1975) points out:

> "... on very few occasions is it possible to see a concern for its overall pattern or for some theoretical framework which would enable a curriculum to be built up rationally according to certain criteria or principles." (p.100).

Frontiers established by Ralph Tyler (1949) in his *Basic Principles of Curriculum and Instruction* have not been followed up in United States research in geographic education in the last 25 years. Part of the reason for this lies in the fact that a search for a rationale lies in the realm of normative theory rather than scientific theory, and therefore is not always looked upon as "pure" research.

A paper by Vuicich and Stoltman (1975) analyzes how views of geography teaching have changed in the United States. Conceptual models of decision making and valuing processes are included as indications of trends for the future. Other papers show the concern for geography's role in general education. Those published around 1965 often made a case for geography as a separate subject. Ten years later, the journal articles focus on geography's contributions to an integrated, or interdisciplinary, curriculum.

Several of the entries under "Elementary" in the *Inventory* reveal an interest in objectives or a search for a rationale. The Instructional Objectives Exchange (1973) operating under a grant from the Department of Health, Education and Welfare to the University of California, Los Angeles, published a booklet of 97 objectives reflecting major social science concepts in the discipline of geography grouped into categories such as map skills, climate, earth-sun relations, and communication. Behavioural objectives in each of eleven categories were arranged in order of ascending grade levels. Validation procedures for such ordering present special problems which for the most part have neither been demonstrated nor resolved.

Needs assessments are reflected in the *Inventory* under such topics as "The Disadvantaged," "Urban Geography." "Environmental Education." Under "The Disadvantaged," the works of Franks and Nolan (1971) and Franks and Baird (1971) in developing geographical concepts with visually handicapped students are of particular interest. Naturally, research interest has also reflected government funding of programmes for exceptional children. Although exceptional children include both retarded and gifted, geographic education research has not given much attention to the latter.

Problems of students from Hispanic American backgrounds are indicated in the development of bilingual and bicultural materials in the Denver, Atlanta, and San Diego school systems. There is a two-way research interest in the Black American and the American Indian. One direction of research focuses on the learning problems of such students; another gives particular attention to curriculum content as it applies to these groups. Generally the curriculum treatment of minorities has undergone considerable revision since the 1950's and the process continues.

If curriculum content reflects the larger world, then topics in urbanization need attention. Such attention is reflected in the series title of the High School Geography Project and two recent yearbooks: (1) *Metropolitan America: Geography Perspectives and Teaching Strategies* – National Council for Geographic Education (Swartz 1972), and (2) *Teaching About Life in the City* – National Council for the Social Studies (Wisniewski 1972). The Tri-University Project gave attention to urban geography in elementary social studies and Arthur and Judy Getis (1972) put forward some concepts for teaching urban geography in the secondary school and college levels.

Developmental studies, especially those replicating or extending the work of Piaget, have been among the major areas of research in geographic education in the past decade, as indicated in the following section on cognitive development. For the most part the geographic studies reinforce Piagetian hypotheses as to the operational stages in the development of children's perception of space although some studies report varying age levels for these stages. These studies have direct application to curriculum building.

Evaluation studies lend themselves to new research techniques and some significant work along these lines has been done in the last decade. The study by Richburg (1975), which applied item sampling procedures in evaluating the High School Geography Project, had particular reference to formative evaluation of an innovative curriculum. As noted earlier, the 1971 Yearbook of the National Council for Geographic Education edited by Dana Kurfman sums up developments in evaluation as applied to different phases of geography learning.

Dissemination studies have been noticeably lacking in geographic education (Walton 1974). Yet, the field of geography is concerned with diffusion patterns and dissemination rates. Geography curriculum projects, their rationale notwithstanding, have been noticeably unsuccessful in gaining wide acceptance among the educational community.

Teacher training is one of the means for the dissemination of new ideas in geographic education. N.D.E.A. (National Defense Education Act) Institutes were one formal means for encouraging such dissemination. Geography Institutes mainly took place prior to 1970 and are the subject of six reports listed in the *Inventory*. Since that time, institutes have turned to other interests, such as Environmental Education, the Right to Read programme, and Indian Teacher Training programmes.

The rapidly expanding frontiers of knowledge have frequently been cited. Research in geographic education should be operating on these frontiers. Bridging the communication gap between workers on the frontiers and those involved in the daily routine of the educational process seems destined to remain a problem. Studies of means of improving the dissemination process can borrow from work in other communications fields.

COGNITIVE DEVELOPMENT – CHILDREN'S THINKING IN GEOGRAPHY

The study of cognitive development in children's ability to think geographically is one of the areas of greater research communication between Britain and the United States. This, in part, stems from mutual attention to the pioneering work of Piaget in Switzerland. American students have taken to replicating the Piagetian studies from Scotland by Jahoda (1963), and British researchers have been attentive to the writings of Bloom and Bruner. In accord with Bruner, Arnsdorf (1967) found that certain map skills, when they are presented developmentally, could be learned earlier than previously thought. Arnsdorf used the term *developmental* with reference to the introduction of concepts in the curriculum, and "this term is probably the hinge upon which our research will swing as we develop a scientific basis for geographic education." (Hayes 1973, p.9).

In his review of British research, Naish calls attention to Rushdoony's (1968) summary of research relevant to children's ability to read maps. The bulk of the studies of children's thinking in geography has been map related. Rushdoony indicated that there were 37 studies in this field between 1960 and

1966. Many of these studies were concentrated at the primary level, grades one to three. He concluded his summary with a suggested grade placement for map concepts and skills.

The Rushdoony article was the start of an interesting debate in the pages of the *Journal of Geography* when Bartz (1970) took the position of devil's advocate and challenged Rushdoony's "neutral or positive interpretation of some map skills research," Her major thesis was that commercially produced maps for school use are much in need of improvement, and that teachers need to be more knowledgeable about how children develop map skills. Rushdoony (1971) responded in an article in which he conceded that commercially prepared maps are not necessarily the most effective means of map instruction. He took the position that map related concepts should be taught prior to, and continued concurrently with, map skills. He quoted research indicating that children develop map skills at an earlier age if they are taught "developmentally, systematically, functionally, and effectively." Bartz (1972) had the last word when she asked, "What is the value of another article on what kids *should* know?" Undoubtedly, the profession of geographic education needs the stimulus of debate, but a need for a more objective, logically-ordered exchange seems to be indicated.

In an experiment with second-grade students in a suburb of Pittsburgh, McAulay (1966) found that the children could transfer observations from the immediate environment to an illustrated map at the conclusion of an instruction period. The students could also use a globe to solve particular problems.

Miller (1967) studied children's ability to coordinate perspective by using a Piaget-type model landscape. A three-dimensional map of a fictitious island group was mounted on a circular table which could be rotated. Photographs were taken from a variety of perspectives. Each child was asked to stand at a particular point, observe a photograph projected on a screen, and then identify where the camera would have been on the map-model when the picture was taken. Sixth-grade (upper elementary) students tended to have well-developed perspective coordination ability. Fourth-grade (middle school) students also made relatively few serious errors. This generally conformed to the findings of Piaget and Inhelder.

Crabtree (1969) investigated whether children in grades 1–3 (primary) could learn the central conceptual system of geographic theory and apply it appropriately in analyzing data of unfamiliar regions. She devised two curricula for use with classes in Los Angeles schools which had not been subjected to previous research. Curriculum A gave instruction in the central organizing concept of the discipline developed through practice in analytical processes. Curriculum B gave instruction in major geographical generalizations developed inductively from illustrative examples. Differences in knowledge acquired by groups exposed to the different curricula were significant at grade 2 only. Achievement in comprehension and application was significantly higher in grades 2 and 3 for those exposed to Curriculum A. There was no significant difference between programmes for grade 1.

Slater (1969) examined the basic dimensions of content and concept learning in geography. Her research results were significantly different from the Piagetian measures of intellectual development, and she concluded that "the learning experiences organized for students in curricula do not appear to utilize abilities which develop with cognitive maturation." Slater's research also established that in the same sample studies there was no evidence that students had acquired any basic geographical concepts which could be used to organize and generalize different occurences of phenomena.

Beilin (1970) correlated the achievement of children on a series of six Piagetian spatial tasks to their achievement on a series of map reading tests. She devised a scale task for three groups of thirty children each in kindergarten (5 years), second grade (7 years), and fifth grade (10 years). The child was asked to arrange a layout of buildings to correspond with a smaller map on a grid. The map, buildings, and grid were all to scale. Since less than half of the students in the fifth grade were able to pass the test, she suggested that map scale would be better left to the sixth grade. Beilin concluded that the ability to complete map tasks may not be related to perspective ability.

A study by Blaut and Stea (1971) received widespread attention. They used aerial photographs with children in Worcester, Massachusetts; PuertoRico; and an isolated peasant community on St. Vincent, West Indies. The children were pre-literate, six-year-olds just entering school, and they were able to display basic components of mapping behaviour from identifying specifics on the photographs to responding to *Gestalt* questions. Blaut and Stea noted that six-year-olds seem to gain pleasure from dealing with map-like representations, and that toy play appears to have an important mapping function, notably as an introduction to scale representation. Their experiments led them to conclude that geographic learning is distinct from social learning.

Sister Satanek (1971) devised a pre-test and a post-test of Piagetian spatial concepts and applied it to 120 fourth-grade students. An experimental group received 9 geography lessons on spatial interaction in the Great Lakes region taught by the investigator during three weeks. The experimental group scored significantly lower than the control group on the Piagetian spatial tasks, but scored significantly higher on the geography concepts post-test. She concluded that it is imperative to assess a child's cognitive level of functioning and then challenge that structure. She also stressed the need to develop manipulative activities for middle grade children (8-12 years).

Rand and Towler (1974) reported on an investigation with 120 students in Indiana elementary schools. Their analysis indicated that Piagetian spatial stages do not adequately describe the children of their sample. Stoltman (1971) also noted that Piaget's theoretical spatial stages were appropriate in sequence, but inappropriate in age level, when compared with data collected from an American sample of children. The researcher attributed this, in part, to the nationalism component of Piaget's research. Rand and Towler and Stoltman all verified the significance of age as a factor in the maturation of children's spatial abilities.

In an experiment of perspective ability and map conceptualization using 104 Michigan children from the inner city, urban fringe, and suburbs, Cobb and Stoltman (1974) used a three-dimensional model village as a test. The children were asked to draw a map of the model as an indication of conceptualization. Contrary to Beilin's findings, their data suggested that the ability to coordinate perspectives and the ability to conceptualize the spatial functions of maps are related.

Hayes (1973) also used a model with a street pattern in his study of school children in Tennessee. The evidence from his study indicated that the concept of linear scale precedes the development of the concept of areal scale by as much as two years. The linear scale concept was mastered at the fourth grade (9 years) level. As in several other studies above, socio-economic status and sex were not significant variables. Both linear and areal scale abilities correlated highly with age. Stone (1972) called attention to scale as the unique factor in the discipline of geography and advocated the multiple-scale approach as an essential tool for comprehension.

During this time period, one of the more definitive writings on children's conception of space was that of Eliot (1970). He traced efforts to define the act of spatial visualization from the late 1920's and included a brief summary of Piaget's work. He discussed Imaginal Variables, Physical Variables, Cultural Variables, Contextual Variables, Landscape Variables, Photographic Variables, Instructional Variables, and Symbolic Variables in visualization experiences. The relevance of this research is that further study may lead to changes in our teaching strategies. Eliot is convinced that geography would benefit "if children were provided fewer games requiring skill in symbolic manipulation and more tasks requiring spatial reasoning" (p.287).

The above studies gain significance as further researches are performed in other geographical and cultural settings. Such work is in progress. In addition to international studies undertaken during a particular time frame, it is also important to make longitudinal studies following up particular groups over a period of time, or observing changes in the same setting after a lapse of time. Through the amassing of such data we can gain further insight into children's thinking in geography. The question remains as to whether the framework of a developmental curriculum can be ascertained through research.

TECHNIQUES OF TEACHING

(i) The Process of Inquiry

Research into the relative effectiveness of different methods of teaching often takes the form of using an experimental group and a control group. An attempt is made to teach the same concepts with the experimental group using a "new" method, while the control group uses customary or traditional methods.

During the period under review, there was continuing research interest in the process of inquiry or discovery method. Carmichael (1965) investigated the development of map reading skills and geographic understanding using 352 students divided into two groups, one using a concept-discovery approach and the other being exposed to expository teaching. The experimental group had greater gain than the control group.

Lahnston (1972) found, in carrying out a study of directed discovery and demonstration strategies with 24 third-grade (9 year old) students, that students in a demonstration-deductive learning group did better on immediate retention than did a group using a directed-discovery, inductive method. Otherwise there was no significant difference in the results from both groups.

Wilson (1972) used six classes of 97 junior high students (12-14 years) divided into 2 control groups using small group discussion methods, 2 experimental groups using peer teaching techniques, and 2 experimental groups using independent study. He found that all groups achieved an ability to think critically regardless of method.

Weimer (1974) reviewed, analyzed, and synthesized research in discovery versus expository methods in several fields from 1908 to 1974. His study could not identify a superior teaching method with respect to retention and transfer. He found a number of methodological problems in experimental designs as well as some semantic difficulties in the studies which he reviewed.

(ii) The Use of Visuals

Several dissertations deal with the use of visuals in geographic instruction. Watts (1965) studied four different presentation modes with 80 students in the 6th grade (11 years). She found that three-dimensional models and diagrammatic drawings were superior to filmstrips, photographs, and verbal definitions in teaching certain geographic terms. Belgum (1967) investigated the teaching of photograph interpretation with 90 students in 6th grade. She concluded that interpretation skills can be increased through instruction.

Thomas (1965) used 73 pupils in the 4th grade (9 years) who studied a prepared unit on modes of transportation to gain understandings of (a) the concept of change, (b) growth of settlements, (c) competition and cooperation, and (d) safety. Three procedures were developed: the first used pictorial illustrations; the second used pictorial illustrations with maps; and the third combined both illustrations and maps plus the completion of prepared outline maps. Data failed to support the hypothesis that significant differences would be found among the various treatment groups.

King (1972) studied how effective illustrations are in supporting the narrative of a geography test. His sample included 202 students in the 6th grade (12 years) in Texas. He found that there was no significant difference among groups using (1) narrative alone, (2) narrative with maps containing limited information, (3) narrative with maps and photographs, (4) narrative with maps, photographs, and illustrations, (5) narrative with maps, placed in an appendix, and (6) narrative with maps containing more information than in the narrative. He concluded that this study supported the growing number of findings that the narrative of a text must continue to carry the burden of information to the students without significant reliance upon the accompanying illustrations.

In studying map symbolism with young children, Giffard (1972) felt that student difficulties with symbolization were usually overstated by teachers who often started with the concept of the round earth

on a flat paper. He felt that students readily grasped symbolization, but did recommend the age of nine as the minimum age for instruction in contouring.

Peletti (1973) compared the effectiveness of graphics for learning geography in the middle grades. He prepared a textbook in five different formats ranging from entirely graphics to entirely narrative. Three fifth-grade, three sixth-grade, and three seventh-grade classes served as the experimental sample. The results with regard to differences among treatments were inconclusive. The study did produce evidence that students who used geography texts with graphics in the role of primary communication require a longer time to complete their units than students using texts with graphics in the role of reinforcement or students using texts without graphics.

Certain problems are evident from the methods of research described above. A commonly recognized difficulty is that of the Hawthorne Effect. Since students in these research projects are getting more attention than usual, often with outsiders present, they tend to perform better. Another problem is that of generalizing from the size of sample used. What happens with 30 third graders in Oshkosh, Wisconsin, may be quite different from what would occur with 30 third graders in Oconee County, Georgia. Still another problem is the infinite number of variables which can affect results when dealing with human subjects. Some of these variables, such as age, sex, intelligence, and economic and ethnic status, may be computed and analyzed. Other variables, such as teacher personality and suitability of materials, are more difficult to identify and test. The pacing of concepts is another variable which does not lend itself readily to description and measurement, and the concepts themselves may be difficult to identify, or classify.

(iii) New Approaches

Research into techniques of teaching may take the form of presenting a proposal for a new approach, or a model, for future geographic instruction. Henzl (1969) proposed adapting discovery learning in a spiral curriculum. Her research report was in three stages: Stage 1 was a philosophical essay; Stage 2 established criteria for generic concepts; and Stage 3 isolated the concept of space for research. Ogren (1974) put forth a six phase model on the reflective method beginning with an individual perceiving discontinuities in his environment. This method, showing parallels to what is commonly called the "scientific method", is proposed as a bridge between research and curriculum.

Our review of the research indicates that inquiry, models, field work, games-simulation, use of maps, media, and individualized learning were some of the special concerns of researchers in geographic education from 1965 to 1975. It is encouraging to see attention to field work in journal articles, although no dissertation research on this topic (which is so neglected in U.S. education) is indicated. In marked contrast, three of the seven entries on games-simulation are dissertations, and the remaining four are ERIC documents. The large number of studies concerned with individualized learning is rather surprising since major attention to programmed learning came in the 1950's and early 60's. Part of this is due to interest in C.A.I. (computer-assisted instruction) at the college level. Also included in this category are two references to mastery learning (Jones 1974 and Healy and Stephenson 1975). Mastery learning is a method of instruction which specifies an expected level of performance on defined learning tasks. This topic has particular relevance to geography and the need for further research studies is indicated here.

Papers on the use of maps are often short "how to" articles. Two dissertations are of interest; that of Carmichael (1965) has been referred to above. The other by French (1932) is not within our time frame. The research situation for maps and mapping has been discussed in detail in the section on Cognitive Development – Children's Thinking in Geography.

In terms of what can be demonstrated by research into techniques of teaching, it can safely be said that under certain conditions, some specified techniques may be proven better for a purpose than other techniques. It is doubtful, however, that any one technique can be shown to be universally superior. Methods that stress individual activities and involvement – the "hands on" approach – are generally considered to be especially effective, but this conclusion is probably better verified outside of geographic

education than by research in the field. Presumably, where a programme "works" it may not really be the programme but the people running it – the personality quotient -- that influences the results. However, performance levels and maturation stages can be determined by research.

(iv) Materials

Since teaching techniques usually involve the use of materials, these materials can be studied for their content coverage, treatment of concepts, readability, motivational characteristics, effectiveness, etc.

Textbooks have often been the subject of investigation by researchers in geographic education. During the decade 1965-1975 there were six analyses of textbooks. These include studies of political concepts in sixth-grade geography tests (High 1968); civic attitudes in high school history and geography texts (Bechtel 1968); geographic information concepts found in selected geography texts (Schomburg 1966), and geographic information in high school history textbooks (Ostapchuck 1972). The treatment of the Turner doctrine in the westward movement was the subject for another study of high school history and geography texts (Littlefield 1967). The utility of phonic generalizations as applied to geography and history vocabularies in state-adopted textbooks was also the subject of investigation (Parker 1968). In the last five years there appeared to be a diminishing number of textbook studies.

The textbook was de-emphasized in the post-Sputnik era when several federally funded education projects flourished. Some of these projects in geographic education were continued, or reached their culmination, in the decade under consideration. These projects required research methods during the field trials which accompanied the development of learning materials and in the efforts to evaluate the programme.

(v) Projects

The Geography Curriculum Project at the University of Georgia prepared supplementary units for the elementary grades (5-12 years) emphasizing the organizing concepts of the discipline of geography. The research focus was the testing, under normal conditions of school instruction, of some psychological constructs of learning, such as the nature of concepts, Ausubel's reception learning model, Bloom's mastery learning, or Bruner's discovery hypothesis. Model units from the primary to the middle and upper grades included: *Earth, Man's Home; Place and Environment; Resource and Production; Comparative Rural Landscapes; Population Growth in the United States and Mexico; Black Population Distribution and Growth in the United States; Functions of Cities;* and *Transporation and the Environment.*

Curriculum materials were developed by Project Social Studies at the University of Minnesota beginning with an Office of Education grant in the spring of 1963. Serious efforts went into the identification of concepts and generalizations for structuring a K-12 (Kindergarten to 12th grade) curriculum on an interdisciplinary basis. Position papers, explaining the stance or rationale, were prepared in each of the social science disciplines. The overall framework of the curriculum which evolved was as follows:

Kindergarten	:	The Earth as the Home of Man
Grades 1 & 2	:	Families Around the World
Grade 3	:	Communities Around the World
Grade 4	:	Communities Around the World, Their Economic Systems
Grade 5	:	Regional Studies (U.S., Canada, and Latin America)
Grade 6	:	United States History: From Community to Society (Indian America to Civil War and Completion of National Expansion)

Grade 7	:	Man and Society (Sociology)
Grade 8	:	Our Political System
Grade 9	:	Our Economic System and Socio-Economic Problems
Grade 10	:	A highly analytical approach to American History
Grade 11	:	Area Studies (Western Europe, USSR, China and India)
Grade 12	:	Value Conflicts and Policy Decisions (Includes problems of underdeveloped countries, Africa South of the Sahara, and Racial Conflict in the U.S.)

The *Inventory* lists nine resource units for grades 5 and 11 from Project Social Studies which were placed in the ERIC System in 1973 and 1974. Despite the magnitude of the task undertaken, and the restriction of budget limitations, the project succeeded in developing a curriculum under the leadership of Edith West. Extensive resource units and curriculum guides were produced and field trials and evaluations were carried out. Additional research is needed to find out more about the long-term cumulative effects of a sequential programme on the development of concepts, skills, and attitudes.

The High School Geography Project (HSGP) began with the work of a joint committee of the Association of American Geographers and the National Council for Geographic Education between 1959 and 1961. Work continued throughout the 1960's under the auspices of the Association of American Geographers with grants from the National Science Foundation which eventually exceeded one million dollars. The final report by Donald J. Patton (ed.) was issued in 1970. The last issue of the HSGP Newsletter (No. 20) was published in September 1971. So the later stages of this project come within the purview of this paper.

Many readers may be familiar with the major units in the HSGP course, *Geography in An Urban Age.* Some of the simulations, such as Portsville, the Metfab Company, and the Game of Farming, have become internationally known. Gunn (1975) reports several countries that acknowledged the HSGP as a source for developing similar simulations. He also outlined features of the HSGP which made it useful in other cultural settings.

The twenty-one entries under the High School Geography Project in the *Inventory* give some clue to its relative significance. James Womack (1969) studied the use of HSGP materials with 650 junior high students (12-14 years) in San Diego and concluded that inquiry-oriented materials are "as effective for learning as" traditional materials. Robert Pratt (1970) found that teacher education was a major outcome of the HSGP, and that geographic education was stronger as a result of the project. In an analysis of the HSGP in Illinois public secondary schools, Jetes (1974) found that HSGP was mainly used by large suburban schools. His questionnaire revealed that users gave the materials a high rating. Daniels (1974), who used HSGP materials with college students, found no significant differences in attitudes toward geography after being taught through the use of HSGP than after being taught through the use of the traditional teaching approach.

The six basic units of the HSGP course were published commercially by the Macmillan Company in 1969 and 1970. As with other projects of this era, the format of the materials did not lend themselves to to the customary production, pricing, and distribution procedures. Project materials came in many bits and pieces which presented inventory and replacement problems. The cost of classroom kits sometimes seemed high to school administrators accustomed to buying regular textbooks. Others found that the materials did not fit their rigid curriculum structures. Although sales figures are not generally available, it seems safe to conclude that the HSGP materials have not been a "best seller" by industry standards. However, it should be noted that a revision of the materials is in progress. Geib (1975), in a dissemination study, noted that whether or not new materials are accepted depends very much on the effects of their exposure upon teachers and others making the adoption decision.

The HSGP did succeed in turning the attention of many professional geographers toward education and the role of geography in the secondary schools. In the widespread publicity which the project achieved, it also brought geography to the attention of principals, curriculum directors, and other educators. Coming at the time it did, the project inevitably reflected the "spatial tradition" in geography, although Unit VI, Japan, was a concession to the regionalists. For the most part, the HSGP avoided references to actual places (Portsville rather than Seattle), preferring to emphasize the "whys" rather than the "wheres." The validity of this premise – to use hypothetical rather than real names – and its effect on the development of a space sense or the mental maps of students has not been adequately explored by educational research.

The Commission on College Geography (CCG) was established under the auspices of the Association of American Geographers in 1963. Funding for the Commission was provided by the National Science Foundation. The primary purpose of the CCG,

> "is to work in various ways to improve geographic programs at the college level compatible to the broader educational needs of colleges and universities throughout the nation." (ERIC ED 051037, 1971).

To meet the stated purpose CCG engages in the investigation, development and distribution of curricula materials suitable in college geography and evaluates geography programmes as they fit into broader programmes of academic study.

The specific major objectives of the commission are summarized as follows:

1. develop approaches to integrate geographic programmes within the broader higher education context, including participation in interdisciplinary curriculum efforts:

2. develop and publish pertinent materials to facilitate the incorporation of recent developments and recent research in undergraduate programmes;

3. advise individuals and institutions in strengthening geography curricula;

4. investigate ways and means to increase the effectiveness of undergraduate courses, including the development of new techniques of presentation; and

5. generate, discuss and develop new schemes to improve undergraduate geography courses and programmes.

The major objectives have been in part fulfilled by an active programme of developing materials in support of teaching and research in geography. Three series of papers have been produced in support of this objective. They are: 1) *Regular Series*, 2) *Resource Papers*, and 3) *Technical Papers*.

The *Regular Series* is composed of papers broad in scope. These are designed for widespread use by teachers of college geography and related fields. Several of these focus on introductory, survey courses. The *Resource Papers* are designed for use by students as well as instructors and provide translations and simplifications of recent, specialized research advances in the field that are not likely to be found in textbooks. Good examples are Gould's paper *Spatial Diffusion* (Gould 1969) and Stohr's paper, *Interurban Systems and Regional Economic Development* (Stohr 1974). Finally, the *Technical Papers* aim to assist college instructors of geography as they modify old courses and develop new ones. A good example is *Computer Assisted Instruction in Geography, 1969* (Association of American Geographers, 1969).

The Commission on College Geography may be viewed as a sort of liaison agency rather than a major contributor of research. Its function is to sponsor the translation of research findings and significant conceptual development in geography into materials for use at the college and university levels. This it accomplishes in several different ways. In addition to the publications enumerated above, other activities

of the Commission have included teacher training workshops, conferences on undergraduate college geography, developing consulting services, formation of a panel on environmental education and self evaluation. Research is not a primary, stated function of the CCG, but research in geographic education is certainly involved and associated with most if not all activities of the Commission.

A special-purpose project to improve graduate level instruction under the aegis of the Association of American Geographers commenced in 1973. This effort, Project of Teaching and Learning in Graduate Geography (TLGG) embraced 16 doctoral granting geography departments in a consortium relationship designed to improve teacher preparation. Associated with TLGG, a survey was conducted to determine what kind of teaching preparation was desired by academic employers, in part to ascertain the desirability of the project objectives and the effectiveness of its methods to potential employers. Fink and Morgan (1976) have summarized the results of the survey. One of the most significant findings was to corroborate the importance of teacher preparation and good teaching in the initial hiring and promotion of geographers at the college level. Teaching in all types of departments was weighted generally more heavily than was research or administrative competence, although most departments in searching for new faculty responded to Fink and Morgan's survey by indicating that they wanted a person who had had teaching preparation, was a good teacher, and who also had a good research background (Fink and Morgan, 1976).

CONCLUSION

This survey of recent research in geographic education has served several purposes. First, building on two important previous works on research in geographic education ("Research in Geographic Learning," *Journal of Geography*, 71, April 1972 and *Research Needs in Geographic Education: Suggestions and Possibilities*, National Council of Geographic Education, 1967), this survey has identified and surveyed major trends in American geographic education in recent years and evaluated some of the significant research work accomplished. In so doing it has established areas where considerable progress has been made. For example, three main areas of progress appear to be: 1) research on cognitive development and the ability of children to learn geography, 2) curriculum, curricular changes, and materials. The work of the High School Geography Project and the Commission on College Geography stand out. Other important developers of materials have been the University of Georgia, Geography Curriculum Project, and the University of Minnesota, Minnesota Project Social Studies. 3) Research on teaching techniques has been extensive, and this too has included the development of materials in support of improved teaching methods.

Although these three areas are identified with recent progress, much remains to be done. Past accomplishments would appear to offer a sound base on which to expand more searching and sophisticated efforts. Contrasted to the areas of progress, the survey also identified several areas where progress has not been rapid. The following are some of the specific research needs which have been noted:

- foundations studies to clarify aims and objectives, concepts and principles
- rigorous examination of individual cases to gain insight into the way geography has developed as a discipline
- the effect of values on the direction of geography
- systematic effort to define a taxonomy of regions
- development of curriculum materials based on research findings in regional analysis
- determine effective ways to develop the mental maps of children
- ways and means of developing better understanding and empathy towards peoples in other lands
- strategies for improving student motivation
- more attention to the gifted learner
- comparative studies on field work methods
- further studies of mastery learning
- development of achievement tests of greater validity
- ascertain the framework of a developmental curriculum
- validate sequential and developmental ordering of behavioural objectives
- further test psychological constructs of learning
- measure the pacing of concepts
- determine performance levels at various maturation stages
- further studies of cognitive development in other geographic and cultural settings
- long-term cumulative effects of a sequential programme on the development of concepts, skills, and attitudes
- means of improving the dissemination process based on work in other communications fields

Additional research needs to include geography's inability to capture a well established place for itself in area studies and international studies programmes and its comparatively modest role in environmental education. Research on both subjects is desirable. This research should look towards the expansion of

teaching and curriculum materials and should involve geographers in training programmes and policy formulation. Such a goal, if achieved, would promote greater acceptance of geography as a worthwhile discipline within the academic marketplace and confirm in the public eye the contributions our subject can make to the betterment of mankind.

REFERENCES

The references are grouped according to subdivisions in the text. Within each subdivision, references are listed alphabetically. Documents which are included in the Education Research Information Service (ERIC) have their ERIC numbers included in the citation so that persons having access to this system may easily find the reference. Similarly, the entries for doctoral dissertations include the volume and number from the Comprehensive Dissertation Author Index, 1961–1972 in which the reference is found.

INTRODUCTION

Meadows, Donnella, et al 1972 — *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind.* New York, Universe Books.

Mesarovic, Mihajlo and Pestel, Eduard, 1974 — *Mankind at the Turning Point: The Second Report to the Club of Rome,* New York, E. P. Dutton/Reader's Digest Press.

National Council for Geographic Education, 1967 — "Research Needs in Geographic Education," *Geographic Education Series No. 7*, Normal, IL, Illinois State University.

National Council for Geographic Education — "Special Issue on Geographic Learning" *Journal of Geography*, 71, April 1972.

Naish, M.C., 1972 — "Some Aspects of the Study and Teaching of Geography in Britain: a Review of Recent British Research," *Teaching Geography No. 18*, Sheffield, England, The Geographical Association.

Saveland, Robert N and Pannell, Clifton W, 1975. — *Inventory of Recent U.S. Research in Geographic Education,* Occasional Paper No. 4, Geography Curriculum Project, University of Georgia.

INTERESTS AND ATTITUDES

Bloomer, Francis Eldon 1971 — *Social Studies Teachers Perception of Topics in Geography,* (Ph.D. the Ohio State University), 215 p., 32/07-A, p.3549.

Carswell, Ronald J.B. 1970 — "Evaluation of Affective Learning in Geographic Education," in Kurfman, Dana G. (Ed.), *Evaluation in Geographic Learning,* The 1971 Yearbook of the National Council for Geographic Education, Belmont, CA, Fearon, pp. 107-130.

Julian, Sister Mary
1967
"Helping Johnny to Like Geography," *Catholic School Journal*, 67, pp. 61-2, October 1967.

McCartin, Rosemarie
1970
"The Cognitive and Affective Learning of Children," in Bacon, Philip (Ed.), *Focus on Geography: Key Concepts and Strategies*, Washington, D.C., 40th Yearbook of the National Council for the Social Studies, pp. 229-261.

Pattison, William D.
1971
"Changing Attitudes and the High School Geography Project," in Ball, John M. et al, *The Social Sciences and Geographic Education: A Reader*, New York, John Wiley & Sons, pp. 218-221.

Pemberton, Dixie Ann
1970
Affective Learning in Geography, (Ph.D., University of Kansas), 203 p., 31/11, p. 66898.

Peters, William
1969
Perceptual Agreement of Social Studies Teachers and Professional Geographers on Aspects of a Cognitive Geographic Paradigm, (Ph.D., University of Minnesota), 176 p., 31/03-A, p. 937.

Sims, Joe Venton
1968
A Comparative Analysis of Attitudes of Students Taught Introductory College Geography by Closed-Circuit Television and The Classroom Discussion Method, (Ed.D., The University of Oklahoma), 113 p., 29/10-A, p.3347.

INTERNATIONAL UNDERSTANDING THROUGH COMPARATIVE EDUCATION

Carter, Alfred Wm.,
1974
A Content Analysis of International Political Geography Concepts for use in the Social Studies, (Ed.D., University of Virginia), 35/04, p. 2117a.

Graves, Norman J.
1975
Geography in Education, London, Heinemann.

Lambert, Richard D.
1975
"An Action Agenda for Area Studies," (The Presidential Address) *Journal of Asian Studies* 35, pp. 7-19, Nov. 1975

Bonine, Michael
1976
"Where is the Geography of the Middle East", *The Professional Geographer*, 28, May 1976, pp. 190-195.

Welch, R., Pannell, C.W. and Lo, C.P.
1975
"Land Use in Northeast China, 1973; A View from LANDSAT – 1", Map Supplement No. 19, Annals of the Association of American Geographers, 65, Dec. 1975.

HISTORICAL DEVELOPMENT OF IDEAS

(i) History and Philosophy

Buttimer, Sister Annette
1974
Values in Geography, Washington, D.C.: Association of American Geographers, Commission of College Geography, Resource Paper, No. 24.

Cirrincione, Joseph M.
1970
The Role of Values in the Teaching of Geography, (Ph.D., The Ohio State University), 31/09-A, 155 p.

Relph, E. C.
1970
"An Inquiry into the Relation between Phenomenology and Geography," *The Canadian Geographer*, 14, pp. 193-201.

Tuan, Yi-fu
1971
"Geography, Phenomenology, and the Study of Human Nature," *The Canadian Geographer*, 15, pp. 181-192.

(ii) Regional Geography and Level of Instruction for the Regional Approach

Amedeo, D and Golledge, R
1975
An Introduction into Scientific Reasoning in Geography, New York: John Wiley, pp. 135-170.

Anderson, Randall, C.
1967
"Trends in Geographic Instruction," *Bulletin of the National Association of Secondary School Principals*, 51, pp. 10-19 February, 1967.

Augelli, J.P.
1968
"Regional Geography in Revolution," *Journal of Geography*, 67, pp. 68-9, February, 1968.

Duncan, Otis Dudley, Cuzzort, Roy P., and Duncan, Beverly
1961
Statistical Geography, Glencoe IL., The Free Press.

Hartshorne, R.
1939
The Nature of Geography, Lancaster, PA, Association of American Geographers.

Kohn, C. F.
1970
"Regions and Regionalizing," *Journal of Geography*, 69, pp. 134-140, March, 1970.

Kostbade, J.T.
1968
"Regional Concept and Geographic Education," *Journal of Geography*, 67, pp. 6-12, January, 1968.

Pattison, W. D.
1964
"The Four Traditions of Geography," *Journal of Geography*, 63, pp. 211-216.

White, Gilbert F.
1965
"Rediscoveri.. the Earth," *American Education*, 1, pp. 8-11, February, 1965.

ASSESSMENT AND EXAMINATIONS

Beyer, B.K. and Hicks, E.P.
1969
Images of Africa: A Report on What American Secondary School Students Know and Believe About Africa South of the Sahara, Pittsburgh, PA, Carnegie-Mellon University, Research in Education (ERIC) 4 (03) ED023693, 40 p.,

California Educational Research Association, 1974
Using Comprehensive Achievement Monitoring in the Classroom, Symposium, California Educational Research Association, San Jose, CA, 1972, Research in Education (ERIC) 09 ED084817, 43 p., 1974.

Charlier, R.H. and Charlier, P.S. 1970 — "Geographic and Environmental Illiteracy Among Educated Americans: An Appraisal," *Science Education*, 54, pp. 281-6, July, 1970.

Ehemann, J. H. 1974 — *The Perceived Political Space of Georgia High School Seniors*, (Ed.D., University of Georgia, 35/10, p. 6536-A.

Glowatski, F. A. 1973 — "Behavioural Objectives for Geography Facilitate Communication and Increase Test Performance," *Journal of Geography*, 72, pp. 36-44, October, 1973.

Hromyk, William John 1972 — *An Evaluation of High School Seniors' Knowledge of Anglo-American Geographic Concepts (Education, Curriculum, Development)*, (Ph.D., University of Oregon), 33/09, p. 4797A.

Mason, G. P. and Owen, E.D. 1971/2 — "Most Visible Countries and Cities: Geography With a Current Events Perspective," *Journal of Geography*, 70, pp. 260-2, May 1971; Reply, W. B. Kory, 71, p. 4. January, 1972.

Monk, J. J. 1971 — "Preparing Tests to Measure Course Objectives," *Journal of Geography*, 70, pp. 157-62, March, 1971.

Ryan, F. L. 1974 — "Effects on Social Studies Achievement of Multiple Student Responding to Different Levels of Questioning," *The Journal of Experimental Education*, 42, pp. 71-5.

Rice, M. J. 1965 — "Improving Elementary Geography: Tests in Geography," *Elementary School Journal*, 66, pp. 134-6, December, 1965.

Scarfe, N. V. 1965 — "Geography Achievement Test," *Journal of Geography*, 64, pp. 325-5, October, 1965.

Slater, Frances Ann 1973 — "Piaget's and Bruner's Theories and Learning in Geography," in Biddle D.S. and Deer, C.E., Eds., *Readings in Geographical Education*, Vol. II, Whitcombe and Tombs, for Australian Geography Teachers' Association, pp. 77-84.

Wood, Susan 1970 — "An Evaluation of Achievement Tests in Geography," *Evaluation of Geographic Education*, The 1971 Yearbook of The National Council for Geographic Education, Belmont, CA, Fearon, pp. 131-151.

Zacur, Maurice Monroe 1970 — *A Measure and Analysis of Geography Achievement in 20 Junior-Senior High Schools of Pennsylvania*, (Ed.D., The Pennsylvania State University), 219 p., 32/01-A, p.263.

Zdanowski, H. S. 1970 — "Geographic Awareness of Eleventh Grade United States History Students," *Journal of Geography*, 69, pp. 475-9, November, 1970.

CURRICULUM AND CURRICULAR CHANGE

Status studies

See Historical Development of Ideas.

Foundation studies

Graves, Norman J.
1975

Geography in Education, London, Heinemann.

Instructional Objectives Exchange, 1973

Instructional Objectives Exchange. Social Studies (Geography) Grade K-9, Los Angeles, CA, Research in Education (ERIC) 02 ED071928, 106 p.

Tyler, Ralph W.
1951

Basic Principles of Curriculum and Instruction, Chicago, University of Chicago Press.

Vuicich, G and Stoltman, J.
1975

Geography in Elementary and Secondary Education: Tradition to Opportunity, Research in Education (ERIC) 10 ED097243, Boulder, Colorado, 77 p.

Needs assessments

Franks, F.L. and Baird, R.M.,
1971

"Geographical Concepts and the Visually Handicapped," *Exceptional Children,* 38, p.52, December 1971.

Franks, F.L. and Nolan, C.Y.
1971

"Measuring Geographical Concept Attainment in Visually Handicapped Students," *Education of the Visually Handicapped,* 2, pp. 1-8, March 1971.

Getis, A. and Getis J.
1972

"Some Current Concepts, Techniques, and Recent Findings in Urban Geography," *Journal of Geography,* 71, pp. 483-90, November 1972.

Swartz, R. D. and others
1972

Metropolitan America: Geographic Perspectives and Teaching Strategies, National Council for Geographic Education, Oak Park, IL, Research in Education (ERIC), 05 ED079165, 420 p.

Wisniewski, Richard (ed.)
1972

Teaching About Life in the City, Washington, D.C. National Council for the Social Studies.

Developmental studies

See Cognitive Development: Children's Thinking in Geography

Evaluation studies

Richburg, R. W.
1975

Using Evaluation to Improve Instruction: Instructor's Guide and Participant's Manual; Teaching Procedures for the New Social Studies, Boulder, CO, Research in Education (ERIC) 10 ED096187, 105 p.

See also Assessment and Examinations.

Dissemination studies

Geib, R. D.
1975

High School Geography Project: From Boulder to Boondocks, A research paper submitted to the Department of Geography, Western Michigan University, Research in Education (ERIC) 10 ED096201, 54 p.

Walton, W.W. and others
1974

Dissemination Recommendations on and Descriptions of Exemplary Projects, Panel Review of Products (PROP) 1972-73, Princetown, NJ, Research in Education (ERIC) ED083292, 103 p.

COGNITIVE DEVELOPMENT: CHILDREN'S THINKING IN GEOGRAPHY

Arnsdorf, V.
1967

"Geographic Education: Principles and Practices in the Primary Grades," *Social Education*, 31 pp. 612-14, November, 1967.

Bartz, Barbara S.
1970

"Maps in the Classroom," *Journal of Geography*, 69, pp. 18-24, January 1970.

Bartz, Barbara S.
1972

"On Maps and Children," *Journal of Geography*, 71, p. 68, February 1972.

Beilin, L. A.
1970

An Analytical-Empirical Study of Sequence in Curriculum Development, (Ph.D., Columbia University), 31/07, p. 3329A.

Blaut, J. M. and Stea, David
1971

"Studies of Geographic Learning," *Annals of the Association of American Geographers,* 61, pp. 387-393, June 1971.

Bloom, B. S. (ed.)
1956

Taxonomy of Educational Objectives: Cognitive Domain, New York, David McKay.

Bruner, Jerome
1966

Toward a Theory of Instruction, Cambridge, Mass., Harvard University Press.

Cobb, R. L. and Stoltman, J.P.
1974

Perspective Ability and Map Conceptualization in Elementary School Children, Research in Education (ERIC) 09 EDO86615, 12 p.

Crabtree, C. A.
1969

Teaching Geography in Grades One Through Three: Effects of Instruction in the Core Concept of Geographic Theory, Final Report, California University, Los Angeles, Research in Education (ERIC) 4 (01) ED021869, 329 p.

Eliot, John
1970

"Children's Spatial Visualisation," in *Focus on Geography* by Phillip Bacon (ed.), Washington, D.C., National Council for the Social Studies, pp. 263-290.

Hayes, Harold L.
1973
The Development of Linear and Areal Scale Concepts in Children, (Ed.D., University of Georgia), 117 p., 34/06, p.3139A.

Jahoda, G.
1963
"The Development of Children's Ideas about Country and Nationality, *British Journal of Educational Psychology,* 33, pp. 47-60.

McAulay, J. D.
1966
"Geography Understandings of the Primary Child," *Journal of Geography,* 65, pp. 170-6, April 1966.

Miller, J.W.
1967
"Measuring Perspective Ability," J. W. Miller, *Journal of Geography,* 66, pp. 167-71, April 1967.

Piaget, J. and Inhelder, B.
1967
The Child's Conception of Space, New York, W.W. Norton.

Rand, D. C. and Towler, J. O.
1974
Piaget's Geographical Spatial Stages: An Examination of Their Relationshop to Elementary Children's Classification-Class Inclusion Abilities, Rand, D.C. and Towler, J. O., Presented to the Annual Meeting of the National Council for Geographic Education, Research in Education (ERIC) 09 ED086616, 33 p.

Rushdoony, Haig A.
1968
"A Child's Ability to Read Maps: Summary of Research," *Journal of Geography,* 67, pp. 213-222, April 1968.

Rushdoony, Haig A.
1971
"The Geographer, the Teacher, and a Child's Perception of Maps and Mapping," *Journal of Geography,* 70, pp. 429-433, October 1971.

Satanek, Mary Clareanne
1971
An Application of Selected Piagetian Spatial Tests to Geographic Education, (Ph.D., Case Western Reserve University), 90 p., 32/08-A, p. 4429.

Slater, Francis M.
1969
An Inquiry into the Kind of Geography Being Learned in Grades 3-12 (Ph.D., The University of Iowa), 164p., 30/02B, p. 705.

Stoltman, J. P.
1971
Children's Conception of Territory. A Study of Piaget's Spatial Stages, (Ed.D., University of Georgia), 90 p.

Stone, K. H.
1972
"Geographer's Strength: The Multiple Scale Approach," *Journal of Geography,* 71 pp. 354-62, September 1972.

TECHNIQUES OF TEACHING

(i) Process of inquiry

Carmichael, Dennis R.
1965
Developing Map Reading Skills and Geographic Understandings by Means of Conceptual Teaching Methods, (Ed.D., University of California, Berkeley), 221 p., 26/12, p. 176

Lahnston, Anton T.
1972

A Comparison of Directed Discovery and Demonstration Strategies for Teaching Geographic Concepts and Generalizations (Education, Curriculum Development), (Ph.D., University of Washington), 33/08, p. 4064A.

Weimar, Richard Charles
1974

A Critical Analysis of the Discovery Versus Expository Research Studies Investigating Retention or Transfer within the Areas of Science, Mathematics, Vocational Education, Language, and Geography from 1908 to the Present, (Ph.D., University of Illinois at Urbana-Champaign), 35/11, p. 7185A.

Wilson, Joe Wayne
1972

The Effect of Three Instructional Designs, Small Group, Peer-Teaching and Independent Study on Ninth Grade Geography Students Ability to Think Critically, (Ed.D., University of Idaho), 98 p., 33/05-A, p. 2000

(ii) Use of visuals

Belgum, Loretta Elaine
1967

An Investigation of the Effect of Teaching Interpretation of Geographic Photographs to Sixth Graders, (Ed.D., University of California, Berkeley), 135 p., 29/01-A, p.53

Giffard, E. O.
1972

Cartographic Symbolism and Very Young Children, Research in Education (ERIC) 03 ED062238, 22 p.

King, Franklin Lafayette
1972

A Study of Selected Variables Involved in the Use of Illustrations with a Geographic Text (Education, General), (Ed.D., East Texas State University), 33/08, p. 3958A.

Peletti, John Charles
1973

The Effects of Graphic Roles on Learning Geography Materials in the Middle Grades, (Ed.D., The University of Georgia) 34/09, p. 5597A.

Thomas, Eric Hubert Gwynne
1965

The Contribution of Selected Teaching Materials Towards the Understanding of Geographic Concepts and Generalizations, (Ed.D., Stanford University), 186 p., 26/11, p. 6641

Watts, Ann Rorem
1965

Conceptual Clarification of Certain Geographic Terms Through the Use of Five Presentation Modes, (Ed.D., The University of Oklahoma), 100 p., 26/03, p.1519

(iii) New approaches

French, Lloyd Charles
1932

The Effect of Specific Training in Vocabulary. The Reading of Maps, Graphs, and Tables, and Organization on Achievement in Geography, (Ph.D., University of Pittsburgh) SO178.

Healy, J. R. and Stephenson, L.K.
1975

"Unit Mastery Learning in an Introductory Geography Course," *Journal of Geography*, 74, pp. 25-31, January 1975.

Henzl, Elizabeth Mary
1969

A Proposal for Adapting Discovery Learning in a Spiral Curriculum to the Teaching of Geography, (Ed.D., Indiana University), 283 p., 30/11-A, p. 4854

Jones, F. G.
1975

Mastery Learning and Geography; Effects Upon Achievement, Retention, and Time-To-Completion, Paper presented at the Annual Meeting of the College and University Faculty of the National Council for the Social Studies, Chicago, IL, November 1974, Research in Education (ERIC) 10 ED09928, 21 p.

Ogren, Albert John, Jr.
1974

The Reflective Method as a Model for Geographic Education, (Ph.D., The Ohio State University), 35/11, p. 7150A

(iv) Materials

Bechtel, Donald Leon
1968

An Analysis of Selected Civic Attitudes in High School American History, Geography, and Civics Textbooks, 1885-1914, (Ed.D., University of South Dakota), 277 p. 29/09-A, p. 2972

High, Lois Ann
1968

A Critical Analysis of Political Concepts in Sixth Grade Geography Textbooks, (Ed.D., Baylor University), 168 p. 29/05-A, p. 1363

Littlefield, Henry Miller
1967

Textbooks, Determinism and Turner, The Westward Movement in Secondary School History and Geography Textbooks, 1830-1960, (Ph.D., Columbia University), 462 p., 28/12-A, p.4886

Ostapchuk, William John
1972

The Geographic Parameters of a Textbook Message: A Study of Geographic Information Contained in High School American History Textbooks, (Ed.D., University of Maine), 151 p., 34/02, p. 517A

Parker, Jesse Joe
1968

The Utility of Phonic Generalizations in their Application to the History and Geography Vocabularies in Certain Specified Textbooks Adopted for Grades Four, Five, and Six, (Ph.D., The Louisiana State University & Agricultural and Mechanical College), 115 p., 29-05-A, p. 1372

Schomberg, Carl Edward
1966

A Study of the Presentation and Reinforcement of Geographic Concepts Found in Selected Geography Textbooks in Adoption in the State of Texas During 1964-65, (Ed.D., University of Houston), 245 p., 27/09-A, p. 2752

(v) Projects

Regular Series, Resource Papers, Technical Papers.

Commission on College Geography
Association of American Geographers
1710 16th Street, N.W. Washington,
D.C., 20009, U.S.A.

Geography Curriculum Project: Occational Papers, Instructional Units.
Dudley Hall
The University of Georgia
Athens, GA 30602, U.S.A.

Project Social Studies: Position Papers, Curriculum Materials.
The University of Minnesota
Minneapolis, MN 55455, U.S.A.

High School Geography Project
Daniels, William Davis
1974

An Investigation of Students' Attitudes Toward Geography Through the Use of the Strategies of the High School (Geography Project (HSGP) at the College Level, (Ph.D., University of Maryland), 35/09, p. 5672A

Fink, L. Dee and Morgan, David J
1976

"The Importance of Teaching in Academic Geography: Report on a National Survey," *The Professional Geographer* 28, pp. 290-297, August 1976.

Geib, R. D.
1975

High School Geography Project: From Boulder to Boondocks, A Research paper submitted to the Department of Geography, Western Michigan University, Research in Education (ERIC) 10 ED096201, 54 p.

Gould, Peter
1969

Spatial Diffusion, Resource Paper No. 4, Commission on College Geography, Association of American Geographers.

Gunn, A.M.
1975

The Role of the High School Geography Project in Geographic Education Reform Worldwide, Research in Education (ERIC) 10 ED096220, 5 p.

Jetes, Teddy Leroy
1974

An Analysis of the High School Geography Curriculum Project in Illinois Public Secondary Schools, (Ph.D., Southern Illinois University), 35/12, p. 7612A.

Patton, D. J. and others
1974

From Geographic Discipline to Inquiring Student, The High School Geography Project, Final Report, Association of American Geographers, Research in Education (ERIC) 09 ED087676, 108 p.

Pratt, Robert Bruce
1970

A Historical Analysis of the High School Geography Project as a Study in Curriculum Development, (Ed.D., University of Colorado), 272 p., 31/09-A, p. 4390.

Stöhr, Walter
1974

Interurban Systems and Regional Economic Development, Washington, D.C., Commission on College Geography, Association of American Geographers.

Womack, James Alonzo
1969

An Analysis of Inquiry Oriented High School Geography Project Urban Materials, (Ph.D., United States International University), 160 p., 30/09-A, p. 3869

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